



A CHECKLIST OF TERMITE FAUNA (ISOPTERA) OF KURUKSHETRA, HARYANA

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ABSTRACT

This study is aimed to know the termite community of the Kurukshetra through sampling by the random hand-picking method, and identified with the keys given by Roonwal and Chhotani, (1989) and Chhotani (1997). A total of 11 species belonging to two families (Termitidae and Rhinotermitidae), two subfamilies (Macrotermitinae and Coptotermitinae) and three genera (*Odontotermes*, *Microtermes* and *Coptotermes*) were observed. Out of these two species are new records from Kurukshetra i.e. *Coptotermes kishori* and *Odontotermes profaeae*. Termitidae is the most diverse of the two families, and the study reveals the presence of total of 19 species under five genera, four subfamilies and two families.

Key words: Termite, Termitidae, Rhinotermitidae, Macrotermitinae, *Coptotermes*, *Odontotermes*, Kurukshetra Campus, species, genera, subfamilies, checklist

The insect order Isoptera comprises of termites, which make up 10% of all animal biomass (Krishna et al., 2013; Effowe et al., 2021). Termites are significant as pests of forestry, housing, and agriculture. Sen Sharma et al. (1975) estimated that these destroy around 33% of the timber produced in India. These are interestingly referred to as “eusocial cockroaches” in the order Blattodea Brunner von Wattenwyl, 1882, and are frequently referred to as “white ants” (Klambhampati and Eggleton, 2000). From all across the world, 3106 species (both alive and extinct) have been recorded (Matsui et al., 2009; Krishna et al., 2013; Effowe et al., 2021). In “Fauna of India and adjacent countries Isoptera (Termites),” Roonwal and Chhotani (1989) and Chhotani (1997) provided the most significant contributions to termites in the Indian region. From the Indian subcontinent, they identified 337 species in seven families and 59 genera (Bangladesh, Bhutan, Myanmar, India, Nepal, Pakistan and Sri Lanka) (Paul et al., 2018). However, it is now anticipated that the ultimate tally would exceed 350 species across the Indian subcontinent (<https://termiteexpert.in/page.php?pageid=22>). In India, approximately 300 species belonging to 52 genera and six families have been documented which make up 9.7% of the world’s termites (Krishna et al., 2013; Rajmohana et al., 2019; Gupta et al., 2021). From Kurukshetra, only 17 species were reported under two families and five genera denoting 5.7% of the Indian termites and 46% of the Haryana termites i.e. 38 (Paul et al., 2018; Vidyashree et al., 2018; Poonia, 2019; Bhanupriya et al., 2022).

This study aims to identify the diversity of the termite fauna of Kurukshetra, Haryana.

MATERIALS AND METHODS

Survey was carried out at the Kurukshetra University (29° 57 N, 76° 48 E, 250 masl) and the samples were collected with random hand selection method (Kakkar et al., 2015; Gupta and Kakkar, 2015; Bhanupriya et al., 2022). Termites were picked up from living trees, tree bark, leaf litter, standing or fallen wooden logs, mounds and the ground. Collected samples were kept in a mixture of glycerol and 70% ethanol, and brought to laboratory for identification using keys (Roonwal and Chhotani, 1989; Chhotani, 1997; Krishna et al., 2013). It was based on a variety of diagnostic features of the soldier caste, including head length, head width, head shape, mandible length, mandible plus head length, body length, body width, and body colour, as well as the tibial spur, tarsal segments, and antennal segments (Scheffrahn and Su, 1994; Wang et al., 2009; Kakkar et al., 2017). The compound microscope was used to evaluate these with measurements, and images were documented, with mean and SD (Mahapatro et al., 2018).

RESULTS AND DISCUSSION

The present study revealed more termites from trees and a total of eleven species were identified under two families (Termitidae and Rhinotermitidae), and subfamilies each (Macrotermitinae and Coptotermitinae). These were under three genera

(*Microtermes*, *Odontotermes* and *Coptotermes*). Of these *Coptotermes kishori* and *O. profeae* were reported first-time from the Kurukshetra campus. Maximum number of species was obtained from a single genus *Odontotermes* i.e. seven (7) of the subfamily Macrotermitinae (Termitidae). *Coptotermes* and *Microtermes* were observed with two species each belonging to subfamilies Macrotermitinae and Coptotermitinae. Subfamily Macrotermitinae (Family: Termitidae) is represented by two genera i.e. *Microtermes* and *Odontotermes* whereas subfamily Coptotermitinae of family Rhinotermitidae is denoted by a single genus *Coptotermes* only. Termitidae was the most dominant family as compared to others (Aiman Hanis et al., 2014; Kakkar et al., 2015; Ranjith and Kalleshwaraswamy, 2021; Bhanupriya et al., 2022); in the present study Termitidae was also found highly diverse with nine species; *O. feae*, *O. assmuthi* and *O. obesus* were the widely distributed in all potential habitats. These observations corroborate with those of Kakkar et al. (2015); Gupta and Kakkar (2015) that *O. feae*, *O. gurdaspurensis*, *O. obesus* and *M. obesi* are the widely scattered species in this study area.

Termite diversity is quite abundant in Kurukshetra University, and eleven species had been reported (Gupta and Kakkar, 2015), which increased to 17 species under five genera, four subfamilies, and two families (Kakkar et al., 2015). In the present study, two species were reported as new records from this area, making it to a total of 19 species (Table 1). Depending on the

Table 1. Diversity of termite fauna from Kurukshetra

| Family and Subfamily | Genus | Species |
|----------------------|------------------------|----------------------------|
| Termitidae | <i>Microcerotermes</i> | <i>M. beesoni</i> |
| Amitermitinae | <i>Microtermes</i> | <i>M. imphalensis</i> |
| Macrotermitinae | | <i>M. mycophagus</i> |
| | | <i>M. obesi</i> |
| | <i>Odontotermes</i> | <i>O. anamallensis</i> ; |
| | | <i>O. assmuthi</i> ; |
| | | <i>O. bhagwati</i> ; |
| | | <i>O. brunneus</i> ; |
| | | <i>O. feae</i> ; |
| | | <i>O. feaeoides</i> ; |
| | | <i>O. guptai</i> ; |
| | | <i>O. gurdaspurensis</i> ; |
| | | <i>O. microdentatus</i> ; |
| | | <i>O. obesus</i> ; |
| | | <i>O. parvidens</i> ; |
| | | <i>O. profeae</i> |
| Rhinotermitidae | <i>Coptotermes</i> | <i>C. heimi</i> |
| Coptotermitinae | | <i>C. kishori</i> |
| Heterotermitinae | <i>Heterotermes</i> | <i>H. gertrudae</i> |

season and habitat, termites may be present or absent due to food preferences and environmental factors (Basu et al., 1996; Gupta and Kakkar, 2015; Vidyashree et al., 2018). *Odontotermes* was the only genus that was widely diverse and available all over the year except February (Gupta and Kakkar, 2015). For example, *O. feae* was collected throughout the year. Since termites and moisture content have a positive correlation, the highest number of termites was found during periods of low relative humidity, rainfall levels, and some wet days (rainy days) (Gathorne-Hardy et al., 2001; Shanbhang and Sundararaj, 2011; Sattar et al., 2013; Ahmed et al., 2018). In terms of species composition, biomass, species richness, and density, the termite community is significantly altered by habitat alterations (Basu et al., 1996).

AUTHOR CONTRIBUTION STATEMENT

The concept and layout of this manuscript were jointly designed by all authors. BP completed the initial manuscript preparation, data analysis, and literature reviews. All authors made revisions, edited the final draft, and approved it.

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CONFLICT OF INTEREST

No conflict of interest.

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